

First record of hyperostotic bones in a common dentex, *Dentex dentex* (Sparidae) from the Adriatic

by

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RÉSUMÉ. - Premier signalement d'os hyperostotés chez un denté commun, *Dentex dentex* (Sparidae), de l'Adriatique.

Un cas d'hyperostose est décrit chez un denté commun pêché en mer Adriatique. Le spécimen déformé présente le gonflement typique des vertèbres caudales hyperostotées. Il s'agit du premier signalement de telles déformations chez un denté commun.

Key words. - Sparidae - *Dentex dentex* - Adriatic Sea - Hyperostosis - Caudal vertebrae.

The occurrence of swollen or hyperostotic bones known as fish hyperostosis (FH) was reported in at least 92 marine teleost fishes belonging to 22 families (Smith-Vaniz *et al.*, 1995). It represents an expansion of the usually thin bones into globulous, gall-like structures. FH is most prevalent among the higher bony fishes and, this phenomenon is also well known in fossil fish bone (Tiffany *et al.*, 1980). Despite its common occurrence, little is known about the biological processes involved in hyperostosis. Patterns of hyperostotic skeletal growth are typically consistent and often species-spe-

cific in all individuals larger than a certain size (Smith-Vaniz *et al.*, 1995). This fact was taken to indicate that this phenomenon is not pathological condition (Fierstine, 1968). Various roles have been suggested for FH, ranging from aids in fin erection (Fierstine, 1968) to hydrostatic correction (Gauldie and Czochanska, 1990) due to the fact that these bones are filled with fat.

Although Smith-Vaniz *et al.* (1995) reported hyperostosis in five (four genera) sparid species, all of them were tropical and subtropical, and *Dentex dentex* was not mentioned in this report.

On 3rd August 2008 one specimen of *D. dentex*, measuring 39.2 cm TL and weighing 1484 g, was caught in the middle Adriatic (out of Šolta Island; 43°21'37.56"N, 16°17'9.82"E). Fish was caught by troll operated at a speed of 4 Nm/h and a depth of approximately 20 m. At the first glance, the fish was completely normal without any visible abnormalities, with body coloration, meristic and morphometric characteristics consistent with previous descriptions (Jardas, 1996). After dissection, some skeletal deformities have been noticed (Fig. 1A, B). The study of the hyperostotic bone was completed by X-ray examination of deformed vertebrae (Fig. 1C).

Analysis revealed that three hyperostotic bones occurred in the

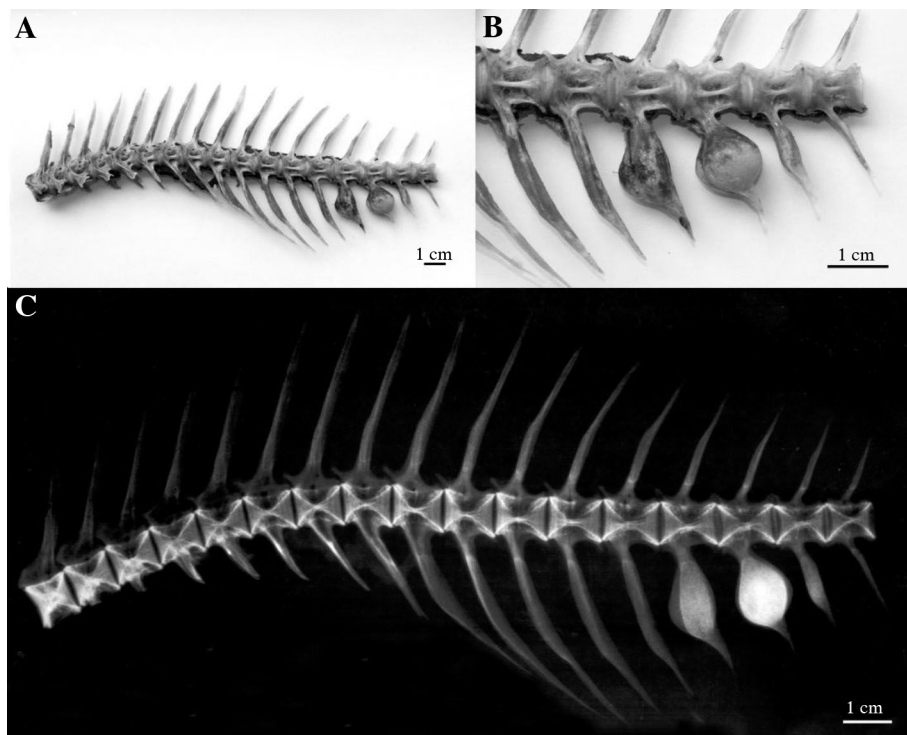


Figure 1. - A, B: Hyperostotic vertebrae; C: Radiograph of partial vertebral column.

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specimen, on the sixth, seventh and eighth haemal spines. Observed hyperostosis on the eighth haemal spine showed less enlargement when compare to other two, although Gauldie and Czochanska (1990) found that the hyperostotic bone, which is the farthest from the tail shows less enlargement.

Although some morpho-anatomical abnormalities of *D. dentex* have been reported in reared juveniles on the skull, fins and vertebrae (Efthimiou, 1996) as well as the saddleback syndrome and caudal fin deformities of adults (Koumoundouros *et al.*, 2001), this is the first record of hyperostosis in the wild for this species. Laroche *et al.* (1982) reported that in Adriatic only *Trachurus trachurus* and *Trachurus mediterraneus* are likely to present FH.

Hyperostosis occurs in tropical, subtropical and temperate species and almost half of all known occurrences are from Carangidae family, in which nearly one third of the known species exhibit FH (Smith-Vaniz *et al.*, 1995). Same authors stated that in most species, hyperostosis develops only in relatively large (mature) individuals. Although we have found only one specimen with hyperostotic bones, its total length was about 40% of the maximum observed total length for this species (Jardas, 1996). Gauldie and Czochanska (1990) found that hyperostotic bones of the snapper *Chrysophrys aurata* increased in size with fish size increment, but the correlation was low. Moreover, the relative sizes of the snapper hyperostotic bones were neither significantly related to age. Hyperostosis occurred in most bones, either head bones, pterygiophores, or caudal vertebrae, with no specific pattern between species (Smith-Vaniz *et al.*, 1995).

Environmental conditions can significantly affect the morphology of fish in respect to the allometric growth of the body, meristic characters, as well as development of morpho-anatomical abnormalities (Divanach *et al.*, 1996). However, Smith-Vaniz *et al.* (1995) reported that no general correlation between FH and environmental factors was apparent. The factors that control this phenomenon in the black skipjack, *Euthynnus lineatus*, are still hypothetical although hydro-mechanical constraints and genetic factors seem to be the most likely (Béarez *et al.*, 2005).

Although hyperostotic bones in fish have incited curiosity for decades, their function still remains unknown. One thing is sure, this is not a pathological condition. However, in the present case, the exceptional character of this FH occurrence might indicate a pathological condition or some genetic aberration. A better understanding of FH and similar phenomenon is necessary in terms of determining limits of variation in harmful hereditary and morpho-genetic processes. So, such findings have to be evaluated on a continuous and accurate basis in Adriatic as well as in other world seas.

Acknowledgements. - The authors wish to thank the reviewers for their constructive comments that helped finalizing this study. Also, special thanks to Boris Skoko for radiographs.

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Reçu le 15 octobre 2009.

Accepté pour publication le 2 décembre 2009.